Client-- Setup Guide: Blaze Board

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Revision History

Date	Name	Version	Change
10/20/2010	SerenaHo	0.1	Initial Draft

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1 Introduction

This document outlines how to setup, build and deploy Windows Client(--) on your Blaze Board. Client(--) is Windows Client built on WoA with a set of components disabled. The goal of Client(--) is to have a base Windows Client running. Feature teams can use this Client(--) as a basis for all feature porting and feature enablement on WoA.

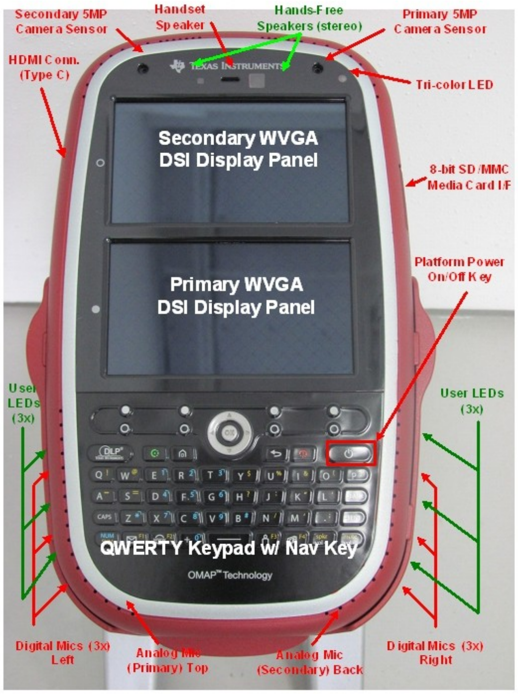
This document assumes the following:

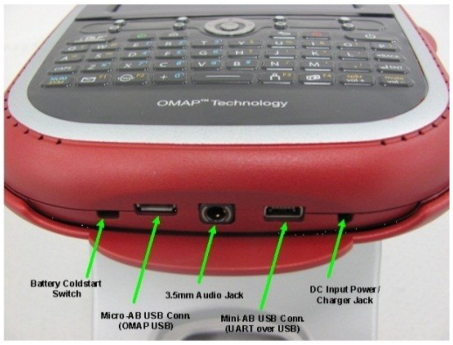
- You have a Blaze board
- You have access to Windows 8 WoA builds

2 Hardware & Accessories

The Blazeis built around the Texas Instrument OMAP4430 System-on-Chip (SoC). This platform is based on an ARM dual core Cortex-A9 Processor.

Note: *Currently not all of the performance features available in hardware (such as caches and multi-proc support) are enabled in the OS. This functionality will come in time.*


Secondary 5MP Camera Sensor
Handset Speaker
Hands-Free Speakers (stereo)
Primary 5MP Camera Sensor
HDMI Conn. (Type C)
Tri-color LED
Secondary WVGA DSI Display Panel
8-bit SD/MMC Media Card I/F
Primary WVGA DSI Display Panel
Platform Power On/Off Key
User LEDs (3x)
User LEDs (3x)
QWERTY Keypad w/ Nav Key
OMAP™ Technology
Digital Mics (3x) Left
Analog Mic (Primary) Top
Analog Mic (Secondary) Back
Digital Mics (3x) Right


OMAP™ Technology
Battery Coldstart Switch
Micro-AB USB Conn. (OMAP USB)
3.5mm Audio Jack
Mini-AB USB Conn. (UART over USB)
DC Input Power / Charger Jack

The following table outlines accessories needed. The ‘X’ in the table marks all the required accessories with your Blaze development kit.

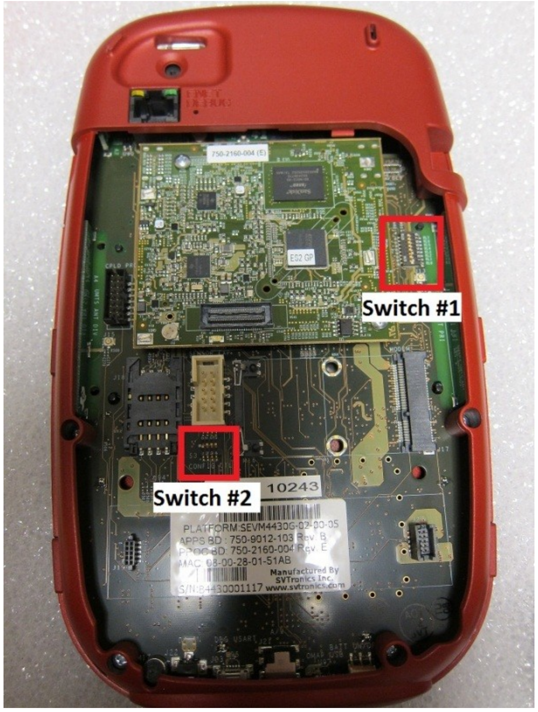
Accessories	Description	Required
USB Micro-B to A Cable	Cable is used for kernel mode debugging. This comes with the Blaze development kit, taped to the bottom of the plastic packing mactierial.	X
USB Mini-B to A Cable	Cable is used for serial console debugger. This comes with the Blaze development kit, taped to the bottom of the plastic packing mactierial.	X
Power Supply	15V/2A power supply. This comes with the Blaze development kit.	X
USB Keyboard/Mouse	Any make/model of USB keyboard/mouse would work. **This needs to be additionally ordered if needed.**	X
USB to PS/2 adapter	Optional. Used for connecting to switch boxes or PS/2 keyboard/mouse. **This needs to be additionally ordered if needed.**	
HDMI Cable	Cable is used to connect the Blaze to a monitor. This comes with the Blaze development kit.	X
Monitor w/HDMI port	LCD monitor with HDMI port. **This needs to be additionally ordered if needed.**	
USB to Ethernet adapter 	The Wii LAN adapter is recommended. Note the built-in Ethernet NIC has not been enabled. **This needs to be additionally ordered if needed.**	X
USB Thumb Drive	Any USB 2.0 4GB or above flash drive. **This needs to be additionally**	X

	ordered if needed.	
USB Hard Drive	Any USB 2.0 16GB or above hard drive. **This needs to be additionally ordered if needed.**	X
Powered USB Hub	Powered HUBs have proven to be necessary to power some USB hard drives and cd-roms **This needs to be additionally ordered if needed.**	X
USB Daughter Board	Required. This is an extension board that supports additional USB hosts. This comes with the Blaze development kit.	X
SD Card	Required. This is necessary to boot the firmware. **This needs to be additionally ordered.**	X

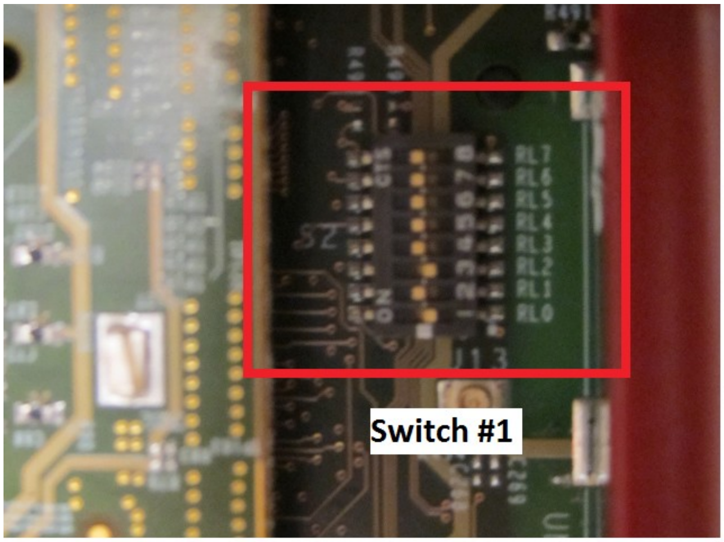
Note that the Blaze development kit comes with an additional battery, power supply, and audio cable. Those are not needed for Client(--) setup.

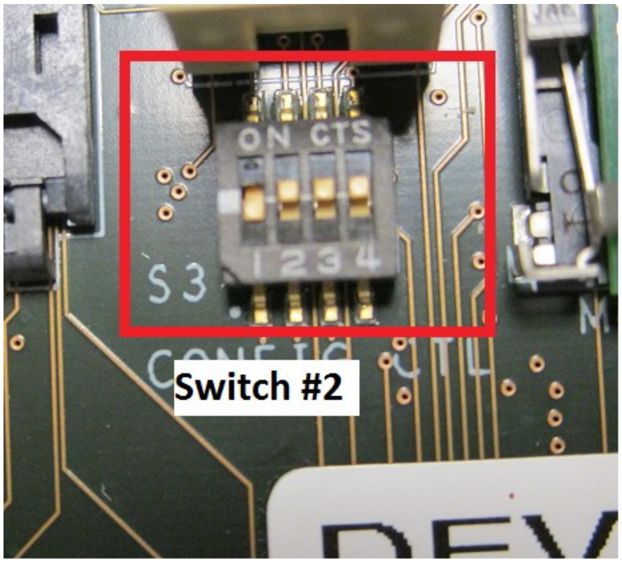
3 Connecting the Cables

1. Change the DIP Switches. There are 2 sets of DIP switches on the TI Blaze board.

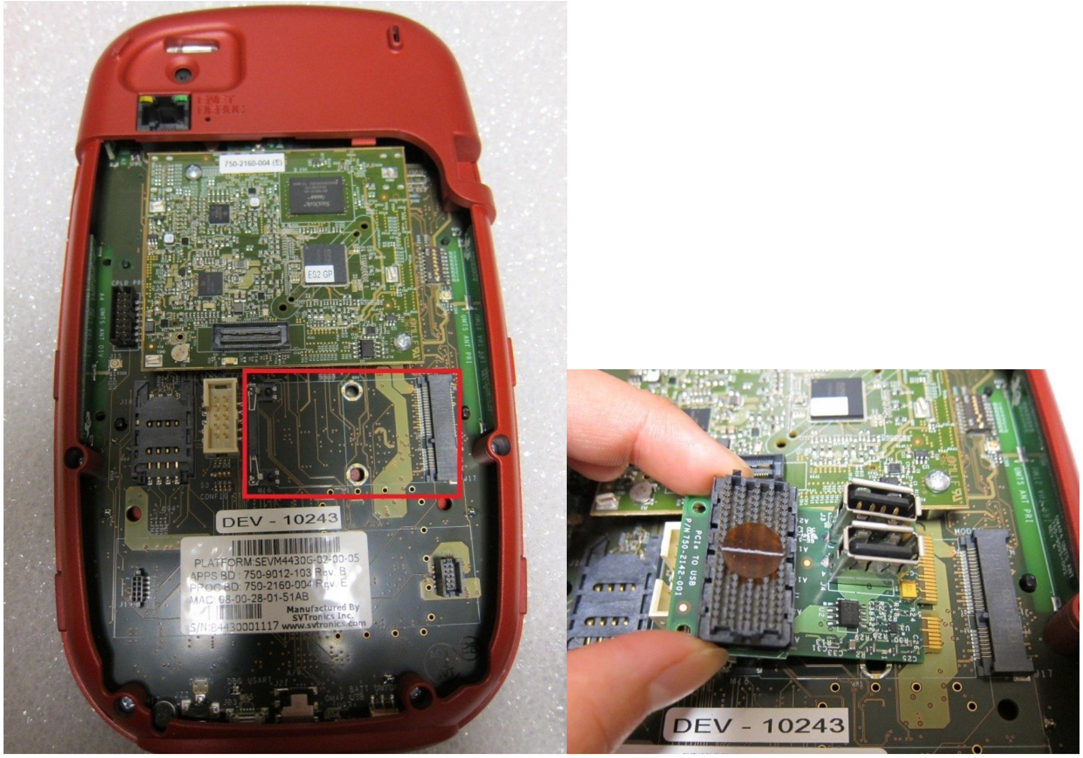

Switch #1
Switch #2
10243
PLATFORM:SEVM4430G-02-00-05
APPS BD: 750-9012-103 Rev. B
PROC BD: 750-2160-004 Rev. E
MAC: 08-00-28-01-51AB
Manufactured By
SVTronics Inc.
S/N: 84430001117 www.svtronics.com
750-2160-004 (E)

Carefully change the switches to the diagram below:

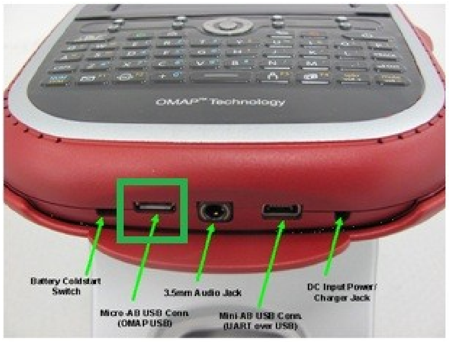

RL7
RL6
RL5
RL4
RL3
RL2
RL1
RL0
S2
J13
Switch #1


ON CTS
1 2 3 4
S3
CONFIG CTL
Switch #2
DEV

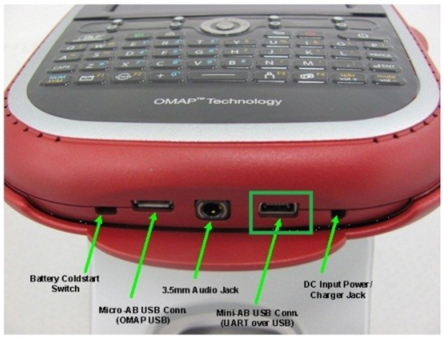
2. Insert the USB daughter board according to the diagram below.



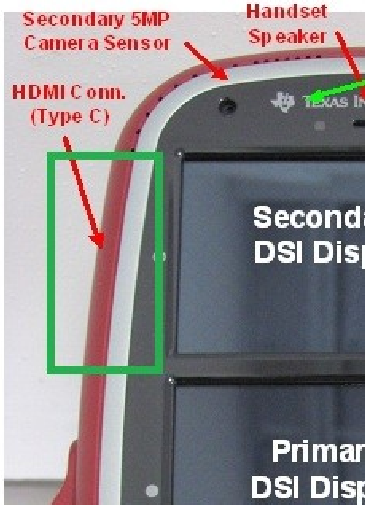
3. Connect the Micro-B to A cable. This enables kernel mode debugging. Insert the Micro-B connector to the Blaze and the other to your host machine.


OMAP™ Technology
Battery Coldstart Switch
Micro-AB USB Conn. (OMAP USB)
3.5mm Audio Jack
Mini-AB USB Conn. (UART over USB)
DC Input Power/ Charger Jack

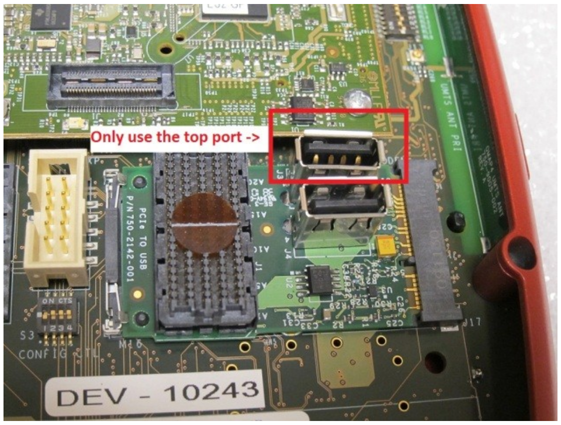
4. Connect the Mini-B to A cable. This is for serial console debugging. Insert the Mini-B connector to the Blaze and the other to your host machine.


OMAP™ Technology
Battery Coldstart Switch
Micro-AB USB Conn. (OMAP USB)
3.5mm Audio Jack
Mini-AB USB Conn. (UART over USB)
DC Input Power / Charger Jack

5. Connect the HDMI cable.
   There are 2 HDMI ports on the Blaze: left side and right side. Only connect HDMI via the left HDMI port, opposite side of the SD slot. The right side of the Blaze also has a HDMI port but this is not to be used.



6. Connect your USB Hub to the USB daughter board. Only use the USB port located at the top of board.



7. Connect your USB hard drive to the USB Hub.
8. Connect your mouse and keyboard to the USB Hub. If you do are out of ports, ensure keyboard is connected to the Hub.
9. Before your plug in the power cable, please make sure you have all necessary software installed on your host machine. (per [Getting Access to Builds, Firmware and Tools])

4 Getting Access to Builds, Firmware, and Tools

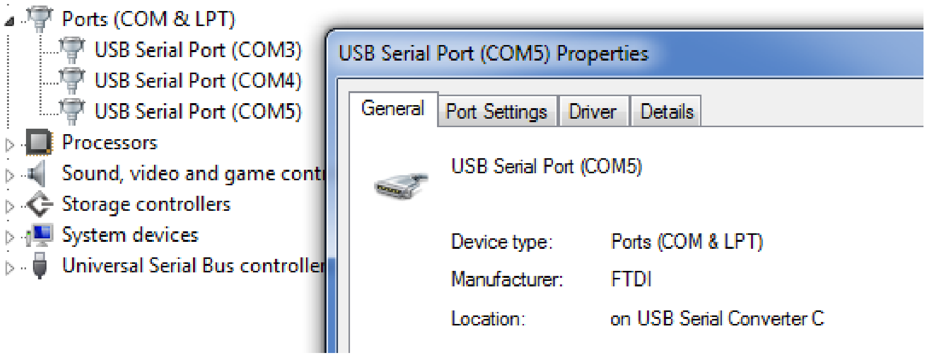
Blaze tools necessary:

- SD Format Tool: SP27608-2.1.8.exe
- Serial Console: [Link to PuTTy download]
- Firmware specific to the Blaze

4.1 Installing a Serial Console

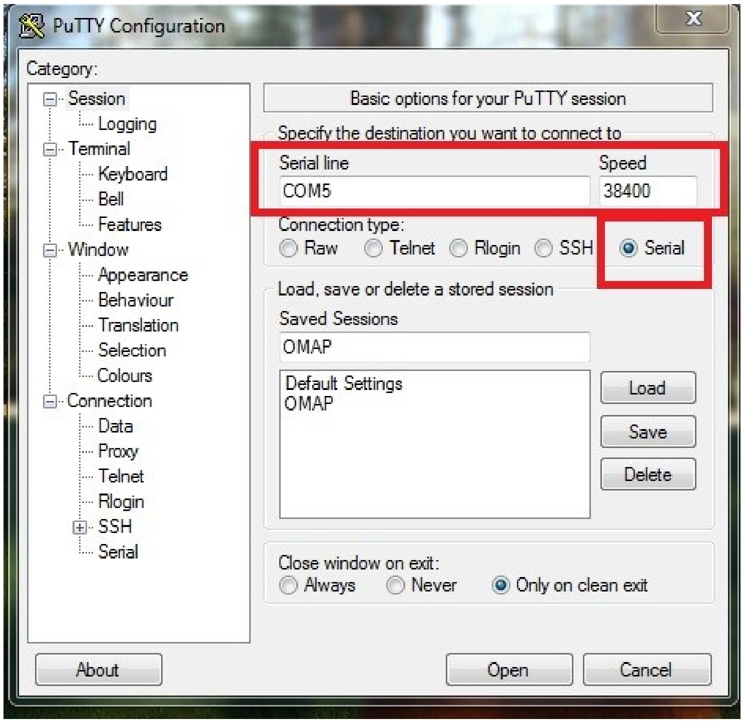
Since firmware is not flashed onto the Blaze, serial console is necessary to interact to the Blaze especially to boot the EFI firmware.

1. Install the serial console (i.e. PuTTy).
2. Open Device Manager. Note that there is a USB Serial Converter C listed under USB controllers.



Device type: Ports (COM & LPT)
Manufacturer: FTDI
Location: on USB Serial Converter C

3. In Device Manager, expand Ports (COM & LPT). Look for the USB Serial Port that matches USB Serial Converter C. Do this by selecting USB Serial Port -> Right Click -> Properties. Note the COM Port.
4. Open your serial console.
5. Setup the COM connection to your Blaze. In PuTTY, this looks like:



Serial line: COM5
Speed: 38400
Connection type: ○ Raw ○ Telnet ○ Rlogin ○ SSH ● Serial
Saved Sessions: OMAP
Close window on exit: ○ Always ○ Never ● Only on clean exit

6. If possible save this session.
7. Open this session.

4.2 Formatting your SD Card and copying firmware:

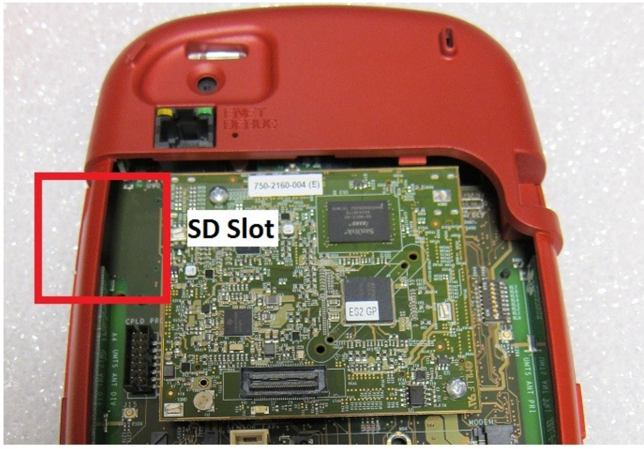
1. Install SP27213.exe (HP USB disk storage format tool) on your desktop
2. Insert SD card into your desktop’s card reader.
3. Open a command prompt with administrative privileges.

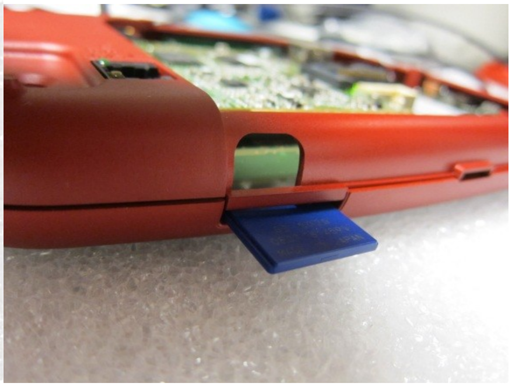
4. Change your current directory to the directory of the utility you just installed. By default this will be located in C:\DriveKey.
5. Execute the following command in your command prompt:

   ```
   HPUSBF %sddrive%: -FS:FAT32 -V:BOOT
   ```

   where %sddrive% is the driver letter of the sdcard
   This will format the SD card.
6. Copy the following firmware files to the SD Card:
   - MLO
   - UEFI.raw

7. Remove the SD card for the card reader. Insert the SD card into the Blaze:



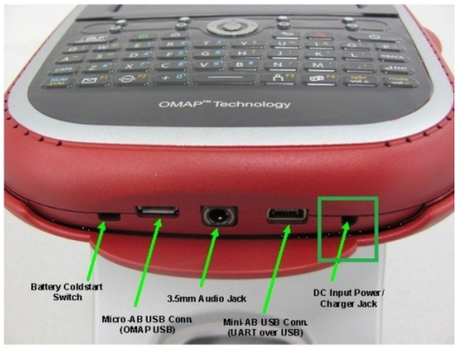


5 Recommended Installation Procedure

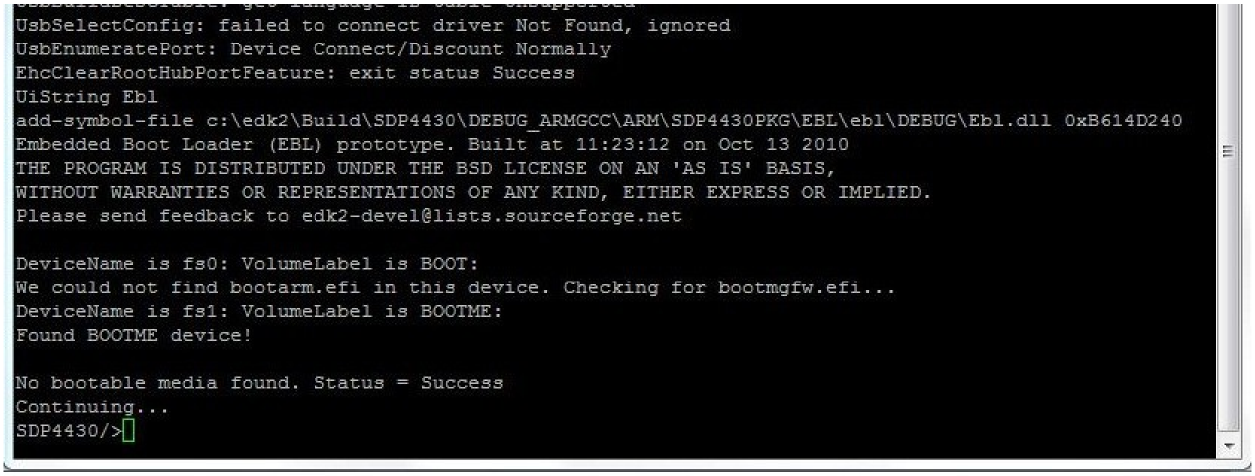
This is the recommended installation procedure for the Blaze:

1. Construct a bootable USB Thumb drive containing WinPE
   - Download the WinPE content and Build content from the connect site to a local location.
   - Format your USB thumb drive (FAT32)
   - Label your thumb drive “BOOTME”
   - Change to either the Free or Checked local directory.
   - Change to your local WinPE directory.
   - Copy all of the content to your USB thumb drive
2. Add Windows Installer to your USB Thumb Drive
   - Change to either the Free or Checked local directory.
   - Change to your local builds directory, labeled “client”
   - Copy all of the content under “Client” to your USB Thumb Drive.

3. Ensure Blaze with the USB thumb drive and a USB Hard Drive attached. Ensure all cables are connected (per Connecting the Cables)
4. Follow Debugging Section to setup your debugger.
5. Start the Serial Console you setup for the Blaze(per Installing a Serial Console)
6. Plug in the power supply for the Blaze.


OMAP™ Technology
Battery Coldstart Switch
Micro-AB USB Conn. (OMAP USB)
3.5mm Audio Jack
Mini-AB USB Conn. (UART over USB)
DC Input Power / Charger Jack

7. Monitor will power up.
8. Serial Console should have output.



```
UsbSelectConfig: failed to connect driver Not Found, ignored
UsbEnumeratePort: Device Connect/Discount Normally
EhcClearRootHubPortFeature: exit status Success
UiString Ebl
add-symbol-file c:\edk2\Build\SDP4430\DEBUG_ARMGCC\ARM\SDP4430PKG\EBL\ebl\DEBUG\Ebl.dll 0xB614D240
Embedded Boot Loader (EBL) prototype. Built at 11:23:12 on Oct 13 2010
THE PROGRAM IS DISTRIBUTED UNDER THE BSD LICENSE ON AN 'AS IS' BASIS,
WITHOUT WARRANTIES OR REPRESENTATIONS OF ANY KIND, EITHER EXPRESS OR IMPLIED.
Please send feedback to edk2-devel@lists.sourceforge.net

DeviceName is fs0: VolumeLabel is BOOT:
We could not find bootarm.efi in this device. Checking for bootmgfw.efi...
DeviceName is fs1: VolumeLabel is BOOTME:
Found BOOTME device!

No bootable media found. Status = Success
Continuing...
SDP4430/>
```

   At this point, Blaze is waiting for the command to boot EFI.

9. In your serial console, find the DeviceName that is labeled BOOTME. The following command will list out the devices connected:
   `device`
10. Start EFI on the device labeled BOOTME:
    `start fs1:\efi\microsoft\boot\bootarm.efi`
    WinPE should load in less than 3 minutes.
11. Ensure Ethernet cable is attached to the USB-to-Ethernet adapter. You should see a blinking light in the USB-to-Ethernet adapter.
12. In the WinPE command prompt, go to the client directory.
    Run setup from the USB Thumb Drive.

If you have enabled debugging, we recommend that you enable debugging by passing the debug name to setup.exe.

```
E.g. setup.exe /usbdebug:WOATARGET
```

13. [Optional] Remove the thumb key and insert your keyboard if your keyboard is not already connected.
    Note: This is a required step in order for the Blaze board to boot off the USB hard drive.
14. Enter the Windows Client Ultimate edition Product Key.
    `D4F6K-QK3RD-TMVMJ-BBMRX-3MBMV`
15. At the “What type of Installation do you want?” Select Custom (Advanced).
16. Partition Selection:
    Delete all existing partitions on the hard disk and select an unpartitioned disk as the destination.
    We recommend that partitioning be done through the setup GUI rather than through diskpart as setup is very picky as to the partition layout.
17. Manual Restarts during setup. Because reset services is not implemented yet, restart has to be manual. Setup requires 2 restarts before completing. To manually restart, unplug the power supply and plug in the power supply again.

    Installation time is approximately **3 hours.**

6 Debugging

Kernel mode debugging via USB is available.

***Note**: You should install the latest debugger.*

1. Ensure the mini USB cable is connected from the Blaze to your PC (per ’Connecting the Cables’).
2. Open a command prompt with administrative privileges.
3. Start the kernel debugger of your choice. Set the targetname to **WOATARGET**

   ***Note:** targetname is case sensitive.*

```
Example:
WinDbg –k usb2:targetname=WOATARGET
```

Note: *If you have multiple Blaze connected to the same debugger host, you will need to mount the images and use bcdedit to change the targetname in the images so they are unique.*

7 FAQ

Category	**Question**
Shutdown	On shutdown, it breaks into the debugger with a debug breakpoint. Known issue. Because reset service is not implemented yet, this debug breakpoint is a trigger for the user to manually reboot the system.
Setup	During setup, it breaks into the debugger with a debug breakpoint. Known issue. Because reset service is not implemented yet, this debug breakpoint is a trigger for the user to manually reboot the system.